

September 15, 2017

Mr. Anthony Krone Risk Manager Shelby County Schools 160 South Hollywood – Room 152 Memphis, Tennessee 38112

RE: Lead in Drinking Water Sampling
Dunbar Elementary School
2606 Select Avenue
Memphis, Tennessee
Tioga Project No.: 24816.01

Dear Mr. Krone,

At the request of Shelby County Schools (the Client), Tioga Environmental Consultants (Tioga) performed sampling of drinking water sources at Dunbar Elementary School for laboratory analysis of total lead concentrations.

As preliminary sampling of select water sources at this school revealed the potential for elevated lead levels in the potable water system, Tioga recommended additional sampling of all water fountains in the school to determine the extent of the issue. Following the receipt of the laboratory analytical results from the initial sampling event, Tioga informed Shelby County Schools Risk Management personnel, who instructed maintenance personnel to take the water fountains at this school out of service pending further testing.

Prior to this additional sampling event, the water fountains throughout the school had been shut off for approximately four days. Sampling was conducted early in the morning, before any potable water sources had been used for the day and prior to the arrival of any students or faculty. Maintenance personnel reactivated the water fountains immediately prior to sampling, and the water fountains were deactivated and taken out of service immediately following the sampling.

On September 12, 2017, Tioga representative Larkin Myers arrived onsite and was escorted through the building by Shelby County Schools personnel. First-draw potable water samples were collected in accordance with the Environmental Protection Agency (EPA) regulations codified in 40 CFR 141.86, and were documented and transferred under chain-of-custody protocol to Waypoint Analytical Laboratories in Memphis, Tennessee for analysis of total lead content.

The EPA has established an action level for public water supply systems at 15 micrograms of lead per liter of water (15 μ g/L). The further EPA recommends that schools remove water fountains and other outlets used for consumption if lead levels exceed 20 μ g/L. Though this school uses water from the municipal water supply and therefore does not qualify as a public water supply system, Tioga recommends that the more conservative EPA action level of 15 μ g/L be used in the decision making process as to the continued operation of the potable water sources at the school.

Results Based on Laboratory Analysis:

Table 1 below summarizes the sampling locations, laboratory analytical results, and EPA action level for lead in drinking water. Sample results with a "<" symbol did not contain lead content above the laboratory detection limit. Samples highlighted in yellow exceeded the EPA action level for lead.

Table 1
Summary of Analytical Results
Dunbar Elementary School
September 12, 2017

Sample ID	Sample Location	Total Lead (µg/L)	EPA Action Level (µg/L)
18-1	Water Fountain Near Room 111A (Bubbler)	1210	
18-2	Low Water Fountain Near Room 107	60.7	
18-3	High Water Fountain Near Room 107	40.3	
18-4	Water Fountain Near Room 104C (Bubbler)	129	
18-5	Low Water Fountain East Side of Cafeteria	25.5	
18-6	High Water Fountain East Side of Cafeteria	17.6	
18-7	Low Water Fountain West Side of Cafeteria	115	
18-8	High Water Fountain West Side of Cafeteria	102	
18-9	Cafeteria Sink West	1.86	
18-10	Cafeteria Sink East	0.762	
18-11	Cafeteria Sink Far East	1.24	15
18-12	Water Fountain Near Room 313A (Bubbler)	160	
18-13	Low Water Fountain Near Room 309	64.6	
18-14	High Water Fountain Near Room 309	47.8	
18-15	Water Fountain Near Room 303 Girls' Restroom (Bubbler)	32.4	
18-16	Water Fountain Near Room 303 Girls' Restroom (Bubbler)	548	
18-17	Low Water Fountain Near Room 213 Boys' Restroom	57.6	
18-18	High Water Fountain Near Room 213 Boys' Restroom	40.5	
18-19	Teachers' Lounge Sink - Right	1.09	
18-20	Teachers' Lounge Sink - Left	<0.513	
18-21	Gym Water Fountain	<0.513	

 $(\mu g/L)$ = Micrograms of lead per liter of water (parts per billion)

A review of the laboratory analytical results of the water samples collected revealed fifteen samples with total lead concentrations above the EPA action level for drinking water.

Shelby County Schools Drinking Water Sampling Dunbar Elementary School September 15, 2017

Recommendations:

Based upon the laboratory analytical results of the potable water samples collected from Dunbar Elementary School, Tioga recommends that the water sources above the EPA action level remain out of use.

The EPA provides technical guidance for reducing lead in drinking water in schools published in the October 2006 revision of the "3Ts for Reducing Lead in Drinking Water in Schools". Tioga recommends that a plan be developed and implemented in accordance with this guidance with additional testing to identify potential sources of lead in this school and to remediate these sources as they are identified. As the next step in determining the sources of lead contamination, Tioga recommends follow-up post-flush testing for water sources that exceeded the EPA action level.

Limitations

Potable water sources with elevated lead levels may potentially be present in areas of the property that are not addressed with this report. This investigation only included the potable water sources specifically addressed.

We appreciate the opportunity to provide you with this service. Should you have any questions regarding this report, please contact me at (901) 791-2432.

Sincerely,

TIOGA ENVIRONMENTAL CONSULTANTS, INC.

Eric Davis, CIE

Environmental Scientist

Enclosure: (1) Laboratory Analytical Report



9/14/2017

Tioga Environmental Consultants Mr. Luke Hall 357 North Main Street Memphis, TN, 38103

Ref: **Analytical Testing**

> Lab Report Number: 17-255-0246 Client Project Description: 18ALL

Project #24816.01

Dear Mr. Luke Hall:

Waypoint Analytical, Inc. received sample(s) on 9/12/2017 for the analyses presented in the following report.

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with the applicable analytical method.

The analytical data has been validated using standard quality control measures performed as required by the analytical method. Quality Assurance, method validations, instrumentation maintenance and calibration for all parameters (NELAP and non-NELAP) were performed in accordance with guidelines established by the USEPA (including 40 CFR 136 Method Update Rule May 2012) and NELAC unless otherwise indicated. Any parameter for which the laboratory is not officially NELAP accredited is indicated by a '~' symbol. These are not included in the scope because NELAP accreditation is either not available or has not been applied for. Additional certifications may be held/are available for parameters, where NELAP accreditation is not required or applicable. A full list of certifications is available upon request.

Certain parameters (chlorine, pH, dissolved oxygen, sulfite...) are required to be analyzed within 15 minutes of sampling. Usually, but not always, any field parameter analyzed at the laboratory is outside of this holding time. Refer to sample analysis time for confirmation of holding time compliance.

The results are shown on the attached Report of Analysis(s). Results for solid matrices are reported on an asreceived basis unless otherwise indicated. This report shall not be reproduced except in full and relates only to the samples included in this report.

Please do not hesitate to contact me or client services if you have any questions or need additional information.

Sincerely,

Randy Thomas **Project Manager**

Rendell H. Thomas

Laboratory's liability in any claim relating to analyses performed shall be limited to, at laboratory's option, repeating the analysis in question at laboratory's expense, or the refund of the charges paid for performance of said analysis.



06510

Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis , TN 38103 Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0246 REPORT OF ANALYSIS Received: 9/12/2017

Lab No: 91681 Matrix: Aqueous

Sample ID: **18-01** Sampled: **9/12/2017 5:37**

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 1210 μg/L 0.500 1 09/14/17 11:51 BKN EPA-200.8

Lab No : 91682 Matrix: Aqueous

Sample ID: 18-02 Sampled: 9/12/2017 5:39

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 60.7 μg/L 0.513 1 09/13/17 18:34 BKN

Lab No: 91683 Matrix: Aqueous

Sample ID: 18-03 Sampled: 9/12/2017 5:40

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 40.3 μg/L 0.513 1 09/13/17 18:39 BKN

Lab No: 91684 Matrix: Aqueous

Sample ID : **18-04** Sampled: **9/12/2017 5:42**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	129	μg/L	0.513	1	09/13/17 18:44	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



06510

Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis , TN 38103 Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0246 REPORT OF ANALYSIS Received: 9/12/2017

Lab No : 91685 Matrix: Aqueous

Sample ID : **18-05** Sampled: **9/12/2017 5:44**

Test Results Units MQL DF Date / Time By Analytical **Analyzed** Method Total Lead 25.5 μg/L 0.500 1 09/14/17 11:56 BKN EPA-200.8

Lab No: 91686 Matrix: Aqueous

Sample ID: 18-06 Sampled: 9/12/2017 5:45

DF Date / Time MQL Test Results Units Ву Analytical Analyzed Method Total Lead EPA-200.8 17.6 μg/L 0.513 1 09/13/17 18:49 BKN

Lab No : 91687 Matrix: Aqueous

Sample ID: **18-07** Sampled: **9/12/2017 5:46**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method
Total Lead	115	μg/L	0.513	1	09/13/17 18:54	BKN	EPA-200.8

Lab No: 91688 Matrix: Aqueous

Sample ID: **18-08** Sampled: **9/12/2017 5:47**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	102	µg/L	0.513	1	09/13/17 18:59	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



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Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis, TN 38103

Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

REPORT OF ANALYSIS Report Number: 17-255-0246 Received: 9/12/2017

Lab No: 91689 Matrix: Aqueous

Sample ID: 18-09 Sampled: 9/12/2017 5:49

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 1.86 μg/L 0.513 1 09/13/17 19:04 BKN EPA-200.8

Lab No: 91690 Matrix: Aqueous

Sample ID: 18-10 Sampled: 9/12/2017 5:50

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 μg/L 1 09/13/17 19:09 BKN

0.513

Lab No: 91691 Matrix: Aqueous

0.762

Sample ID: 18-11 Sampled: 9/12/2017 5:51

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 1.24 μg/L 0.513 1 09/13/17 19:20 BKN

Lab No: 91692 Matrix: Aqueous

Sampled: 9/12/2017 5:55 Sample ID : **18-12**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	160	μg/L	0.500	1	09/14/17 12:01	BKN	EPA-200.8	

Qualifiers/ **Definitions** DF

Dilution Factor

MQL



06510

Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis, TN 38103 Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0246 REPORT OF ANALYSIS Received: 9/12/2017

Lab No: 91693 Matrix: Aqueous

Sample ID: **18-13** Sampled: **9/12/2017 5:57**

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 64.6 μg/L 0.500 1 09/14/17 12:06 BKN EPA-200.8

Lab No: 91694 Matrix: Aqueous

Sample ID: **18-14** Sampled: **9/12/2017 5:59**

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 47.8 μg/L 0.513 1 09/13/17 19:25 BKN

Lab No: 91695 Matrix: Aqueous

Sample ID: 18-15 Sampled: 9/12/2017 6:00

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 32.4 μg/L 0.513 1 09/13/17 19:30 BKN

Lab No: 91696 Matrix: Aqueous

Sampled: **9/12/2017 6:02**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	548	μg/L	0.500	1	09/14/17 12:17	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



06510

Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis , TN 38103 Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

Report Number: 17-255-0246 REPORT OF ANALYSIS Received: 9/12/2017

Lab No : 91697 Matrix: Aqueous

Sample ID : **18-17** Sampled: **9/12/2017 6:04**

Test Results Units MQL DF Date / Time Bv Analytical **Analyzed** Method Total Lead 57.6 μg/L 0.500 1 09/14/17 12:22 BKN EPA-200.8

Lab No: 91698 Matrix: Aqueous

Sample ID: 18-18 Sampled: 9/12/2017 6:05

DF MQL Date / Time Test Results Units By Analytical Analyzed Method Total Lead EPA-200.8 40.5 μg/L 0.500 1 09/14/17 12:27 BKN

Lab No: 91699 Matrix: Aqueous

Sample ID: 18-19 Sampled: 9/12/2017 6:06

Results Units MQL DF Date / Time Analytical Test By **Analyzed** Method Total Lead EPA-200.8 1.09 μg/L 0.513 1 09/13/17 19:35 BKN

Lab No: 91700 Matrix: Aqueous

Sampled: **9/12/2017 6:08**

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method	
Total Lead	<0.513	μg/L	0.513	1	09/13/17 19:40	BKN	EPA-200.8	

Qualifiers/ Definitions DF

Dilution Factor

MQL



06510

Tioga Environmental Consultants

Mr. Luke Hall

357 North Main Street Memphis , TN 38103 Project 18ALL

Information: Project #24816.01

Report Date: 9/14/2017

Lab No: 91701 Matrix: Aqueous

Sample ID: 18-21 Sampled: 9/12/2017 6:12

Test	Results	Units	MQL	DF	Date / Time Analyzed	Ву	Analytical Method
Total Lead	<0.513	μg/L	0.513	1	09/13/17 19:45	BKN	EPA-200.8

Qualifiers/ Definitions

DF

Dilution Factor

MQL



Cooler Receipt Form

Customer Number: 06510

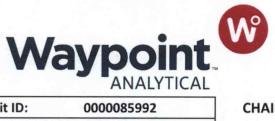
Customer Name: Tioga Environmental Consultants

Report Number: 17-255-0246

Shipping Method

		0			
○ Fed Ex	US Postal	◯ Lab		Other:	
UPS	Client	Ourier Courier		Thermometer ID:	NA
Shipping contain	ner/cooler uncomprom	ised?	Yes	○ No	
Number of coole	ers received	Γ	1		
Custody seals in	tact on shipping conta	ainer/cooler?	Yes	○ No	Not Requi
Custody seals in	tact on sample bottles	s? (Yes	○ No	Not Requi
Chain of Custod	y (COC) present?		Yes	○ No	
COC agrees with	h sample label(s)?		Yes	○ No	
COC properly co	ompleted		Yes	○ No	
Samples in proper containers?			Yes	○ No	
Sample containers intact?			Yes	○ No	
Sufficient sample volume for indicated test(s)?			Yes	○ No	
All samples received within holding time?			Yes	○ No	
Cooler temperat	ure in compliance?		Yes	○ No	
	arrived at the laborate onsidered acceptable gun.		Yes	● No	
Water - Sample	containers properly p	reserved	Yes	○ No	○ N/A
Water - VOA via	ls free of headspace		Yes	○ No	● N/A
Trip Blanks rece	ived with VOAs		Yes	○ No	● N/A
Soil VOA method	d 5035 – compliance o	criteria met	Yes	○ No	● N/A
High concent	tration container (48 h	r)	Lov	v concentration EnC	ore samplers (48 h
High concent	ration pre-weighed (m	nethanol -14 d)	Lov	v conc pre-weighed	vials (Sod Bis -14 o
Special precaution	ons or instructions inc	luded?	Yes	● No	
Comments:					

Signature: Danyale Love Date & Time: 09/12/2017 13:26:14



Kit ID: 0000085992
Initiated By: Andy Parrish
Initiated Date: 9/8/2017
Project Comment

CHAIN-OF-CUSTODY

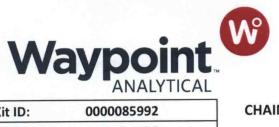


Tioga Environmental Consultants
18ALL

17-255-0246 06510 09-12-2017 12:39:08

Company N	Name	Company Number		Clie	,			
Tioga Enviro	nmental Cons	ultants 06510		Mr. Luke	e Hall			
Site Name	18ALL 24816.01			Date Re	esults Ne		Fed E Couri	of Shipment x ☐ UPS ☐ USPS er ☑ Client Drop Off
LIMS Proje	ct ID	(901) 791-2432	000.00000000000000000000000000000000000		eda	er Email VīS	Site/Faci	lity ID #
Date	Time	Sample ID	Matrix	Grab/ Comp	# of Cont	Container Type	Preservation	Analyses
9/12/17	5:37	18-01	Aqueous	G	1	Plastic - Pint	NONE	Total Lead/DW
-1	5:39	18-02	Aqueous	1	1	Plastic - Pint	NONE	Total Lead/DW
	5:40	18-03	Aqueous		1	Plastic - Pint	NONE	Total Lead/DW
	5:42	18-04	Aqueous		1	Plastic - Pint	NONE	Total Lead/DW
	5:44	18-05	Aqueous		1	Plastic - Pint	NONE	Total Lead/DW
	5:45	18-06	Aqueous		1	Plastic - Pint	NONE	Total Lead/DW
	5:46	18-07	Aqueous		1	Plastic - Pint	NONE	Total Lead/DW
1	5:47	18-08	Aqueous	1	1	Plastic - Pint	NONE	Total Lead/DW

	For Laborato	ry Use Only	Sampled by (Name - Print)	Client	Remark	s/Comments		
Ice	Custody	Lab Comments	Larkin Myers		2	1 Kr 141		
	Seals		Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Date	Time
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Blank/Co	oler Temp							
A /r			Relinquished by: (SIGNATURE)	Date	Time	Received by: (SIGNATURE)	Dite	Time
NI	1					C. Dunlys	12	132



Kit ID:	0000085992
Initiated By:	Andy Parrish
Initiated Date:	9/8/2017
Project Comme	ent

CHAIN-OF-CUSTO



Company Name		Company Number		Client P	roject l	Manager/Contact	Purchase Order Number			
Tioga Environmental Consultants		06510		Mr. Luke	Hall					
			Project Number	RUSH – Additional charges apply Special Detection Limits(s) Date Results Needed				Method of Shipment Fed Ex UPS USPS Courier Client Drop Off Other		
LIMS Project ID		Project Manager Phone #		Project Manager Email				Site/Facility ID #		
			(901) 791-2432	-	thall@tic					
Date	Time		Sample ID	Matrix	Grab/ Comp	# of Cont	Container Type	Pres	ervation	Analyses
9/12/17	5:49	18-6)9	Aqueous	G	1	Plastic - Pint	N	NONE	Total Lead/DW
1	5:50	18-	10	Aqueous	1	1	Plastic - Pint	N	NONE	Total Lead/DW
	5:51	18	-11	Aqueous		1	Plastic - Pint	N	NONE	Total Lead/DW
	5:55	18-	-12	Aqueous		1	Plastic - Pint	ı	NONE	Total Lead/DW
	5:57	18-	-13	Aqueous		1	Plastic - Pint	1	NONE	Total Lead/DW
	5:59	18-	-14	Aqueous		1	Plastic - Pint	ı	NONE	Total Lead/DW
	6:00	18-	15	Aqueous		1	Plastic - Pint	1	NONE	Total Lead/DW
1	6:02	18.	-16	Aqueous	1	1	Plastic - Pint	1	NONE	Total Lead/DW

For Laboratory Use Only			Sampled by (Name - Print)	Client Remarks/Comments					
Ice	Custody	Lab Comments	Larkin Myers	24	m 141				
	Seals		Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time			
YN	Y/N)	-	Maria	12/17 1233					
			Relinquished by (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Date Time			
Blank/Co	oler Temp								
			Relinquished by: (SIGNATURE)	Date Time	Received by: (SIGNATURE)	Dete Time			
N	M				C. Dulo	12:33			



Received by: (SIGNATURE)

Kit ID:	0000085992
Initiated By:	Andy Parrish
Initiated Date:	9/8/2017
Project Comm	ent

Blank/Cooler Temp

CHAIN-OF-CUSTOPY



Tioga Environmental Consults 18ALL

17-255-0246 06510 09-12-2017 12:39:08

Company Name		Company N	Company Number			Client Project Manager/Contact				Purchase Order Number			
Tioga Enviror	nmental Cons	ultants 06510		Mr. Luke	e Hall								
Site Name Project Num 18 ALL 2481			6.01	ZH HOUR RUSH – Additional charges apply Special Detection Limits(s) Date Results Needed Project Manager Email				Method of Shipment Fed Ex UPS USPS Courier Client Drop Off Other Site/Facility ID #					
LIMS Projec	at ID	(901) 791-24	ager Phone # ,		avi	S		Site / Facility					
Date	Time	Sample ID	Matrix	Grab/ Comp	# of Cont	Container Type	Pres	ervation	Ana	alyses			
9/12/17	6:04	18-17	Aqueous	G	1	Plastic - Pint	1	IONE	Total Lead/DW				
	6:05	18-18	Aqueous	1	1	Plastic - Pint		NONE		Total Lead/DW			
	6:06 18-19		Aqueous		1 Plastic - Pint		1	NONE Tot		al Lead/DW			
	6:08	18-20	Aqueous		1	Plastic - Pint	1	NONE	Total I	Lead/DW			
1	6-12	18-21	Aqueous	1	1	Plastic - Pint	ı	NONE	Total	Lead/DW			
			Aqueous		1	Plastic - Pint		NONE	Total	Lead/DW			
			Aqueous		1	Plastic - Pint	-	NONE	Total	Lead/DW			
		ial ·	Aqueous		1	Plastic - Pint	1	NONE	Total	Lead/DW			
÷	For Laborato	ry Use Only	Sampled by (Name -			Client Remarks/Com	nments	TAT					
Ice	Custody Seals	Lab Comments	Relinquished by: (SIG	Ner	5	Date Time Reco	ceived by: (SIGNATURE) Date Time						
(N)	YAN		Relinquished by: (SIG	SNATURE	E)		eived by: (SIGNATURE) Dat			Date Time			

Date

Time

Relinquished by: (SIGNATURE)